MONOGRAPH

ON

IRON AND STEEL INDUSTRIES

IN THE

PUNJAB,

1906-07.

Published by Authority.

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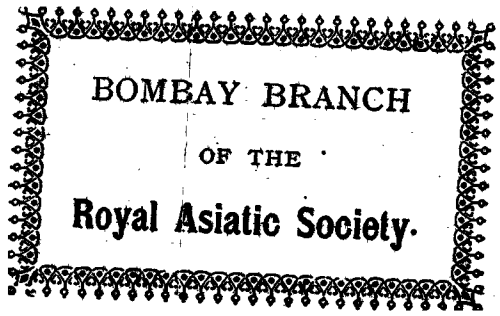

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No. 262 (Com. & Indy.).

FROM

W. M. HAILEY, ESQURE,
Secretary to Government,
Punjab and its Dependencies,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
COMMERCE AND INDUSTRY DEPARTMENT.

Dated Lahore, 24th April 1908.

Commerce and Industry.

SIR,

WITH reference to the correspondence ending with your endorsement No. 9517—9523-32, dated 5th December 1906, I am directed to submit, for the information of the Government of India, a monograph on "Iron and Steel Industries" in the Punjab by Mr. G. Worsley, Assistant Commissioner, together with the Director of Land Records' forwarding letter No. 848—701-287, dated 6th April 1908.

I have the honour to be,
SIR,
Your most obedient Servant,
W. M. HAILEY,
Secretary to Government, Punjab.

Punjab Government Press, Lahore—16-5-08—2147—60 9—C. L.

No. 261 (Com. & Indy.).

FROM

D. J. BOYD, ESQUIRE,

Under-Secretary to Government, Punjab,

Revenue Department,

To

THE DIRECTOR OF LAND RECORDS, PUNJAB.

Dated Lahore, 24th April 1908.

Commerce and Industry.

SIR,

IN acknowledging the receipt of your letter No. 848—701-287, dated 6th April 1908, forwarding a monograph on "Iron and Steel Industries" in the Punjab by Mr G. Worsley, Assistant Commissioner, I am directed to say that the Lieutenant-Governor agrees with the opinion of the Financial Commissioner that Mr. Worsley deserves credit for his interesting monograph.

I have, &c.,

D. J. BOYD,

Under-Secretary to Government, Punjab,

Revenue Department.

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Punjab Government Press, Lahore—16-5-08—2147—500—C. L.

IRON AND STEEL INDUSTRIES

IN THE

PUNJAB.

Industries of all kinds and in all countries arise from the needs felt by the people for articles of such a kind as will help them in their daily life: and variety increases with progress. Hence to understand the character of any particular industry in any country, we must find out what it is that the people of the country mainly depend upon for their subsistence. The Punjab is above all things an agricultural country, and the vast majority of its inhabitants follow the plough: hence the greater portion of the iron and steel industry derives its existence from agriculture. Of late years, however, owing to English occupation and a general rise in the standard of living, other needs, besides those of the agriculturist, have made themselves felt, and further subsidiary industries have sprung up, in order to supply the wants felt by those who have reached a higher and more advanced civilization than the peasant. Naturally articles supplying such wants are of a more polished nature and though they perhaps form a small percentage of the iron and steel articles manufactured in the province, yet they deserve the more attention as being the outcome of superior skill and intellect, and exhibiting at times certain artistic merits.

2. As a whole the iron and steel industry divides itself naturally into the utilitarian and the artistic. The distinction between the two however cannot be drawn too closely as many articles may combine elements of both.

Working however on this broad distinction, one naturally considers first the utilitarian side of the industry as being, if not the most interesting, at any rate the most important, and the side which is the most likely to develop.

Utilitarian manufactures.

3. Here again we may make another rough division and consider (*a*) the somewhat crude work of the village lohar as exhibited mainly in agricultural implements and (*b*) the more advanced work of the town lohar working independently or in a factory or shop.

(*a*) Village lohar's work.

The village lohar's work is of course almost entirely subordinate to agriculture and practically the only articles produced are such as are required by the peasant for his cultivating and harvesting operations, or for his domestic use. In every village almost at least one lohar exists, who provides all the iron implements required in the village. He is a menial of the maliks of the village and, as a reward for his services, receives a certain percentage of grain at each harvest. He does not possess any high degree of skill in his art and as a rule does not attempt to soar high in his profession. He is quite content to turn out a crude but fairly strong article which answers the purposes well enough.

The chief articles manufactured by him are the ordinary agricultural implements, such as ploughshares, scythes, rakes, axes, etc., and the common pots and pans used in every peasant's house for cooking food in or for holding grain. He practically confines himself to work in iron though he occasionally welds on steel edges to the blades of scythes or axes.

The raw material is obtained generally from the local bania, and usually consists of old scrap iron and disused rails, and the like, obtained at an auction, or bought from the railway authorities. An average price for such is about Rs. 4 a maund. In former days when a certain amount of iron was obtainable in parts

of the Punjab this may have been used, but now practically only old iron is used and occasionally English iron. This is imported in bars, or in sheets, and owing to the convenience of the shapes is sometimes used. The village lohar's method of manufacture merits little description. He generally simply hammers out a piece of iron into the desired shape, working if possible in cold iron and only heating it when absolutely necessary. The furnace is of mud, and the fuel, when any is used, is charcoal.

The quality of the work is probably much the same as it was a hundred years ago, the articles made being very rough and unfinished: but in villages near big towns, the lohar has succeeded in extending his field of operations slightly and is able to make more elaborate articles than his predecessor. It is in fact rather a grievance with the craftsmen of the towns that, whereas formerly the village lohar could only manufacture the very simplest articles and often do little more than repair implements originally made in the towns, he can now make the implements himself, and generally speaking, compete with his fellow in the town. However the village lohar is never likely to stand in the fore front of this profession, as he works entirely to order and does not store any articles he makes, and his only object is to satisfy the very small needs of his fellow villager.

(b) Lohar's work in the towns.

4. Turning from the village craftsman to his fellow in the town, we find on the whole a considerable improvement in the standard of work. As a rule the smith of the town turns out an article of a much more polished and finished nature, and his ambition soars higher. He does not, like the village lohar, work in iron simply because he happens to be a lohar by caste but he takes much greater interest in his work and makes attempts to improve.

The work carried on in towns and cities may roughly be considered under two heads. In the first place we have the independent artisan working in his own house, surrounded by his family, not confining himself to any particular kind of article, but working mainly to order: and secondly, there is the smith who works for a wage in a shop or factory. The distinction between these two types is a very real one for the former represents the old system of cottage labour, whilst the latter is the outcome of the modern factory system.

It is unnecessary to say very much about the independent lohar. His work is very similar to that of the village smith, except that it is usually more polished and as a rule he makes a little more use of steel. The chief articles turned out by workmen of this class are knives, razors, scissors, buckets, nails, etc. The process of manufacture is as follows. The furnace generally consists of a depression in the ground, covered by a vault of burnt clay shutting the fire in behind. The fuel employed is charcoal, and bellows of various kinds are used. The most common type is the ordinary hand bellows, but a curious pattern is found in some places. A narrow wooden pipe is laid just below the ground extending from the fireplace to a wooden box: the box contains a circular fan which is turned by a handle outside, and the current of air caused by the rotation of the fan passes down the pipe into the fire. This type of bellows is fairly common in the Ambala district. Beyond this the only implements the lohar requires are an anvil and a hammer (generally about 2 lbs. in weight), and the ordinary cutting and shaping tools such as chisels, punches, files, etc.

The raw material used is generally, as in the villages, old scrap iron which goes by the name of 'kacha' loha. Besides this is obtained what is called "pakka loha" which consists of the various kinds of iron imported into India, sometimes in bars and sometimes in sheets. Lastly there is "ispat," an inferior and somewhat brittle steel largely used in the manufacture of cutlery.

The average prices of these three kinds of metal in most of the Punjab bazars are as follows:—

Kacha loha from 4 to 7 rupees a maund.
Pakka loha from 8 to 12 rupees a maund.
Ispat from 7 to 11 rupees a maund.

It is impossible to estimate accurately the profits of a smith who works mainly to order and whose sales are of a very uncertain nature: but probably they do not often exceed 15 rupees a month.

Shops, Factories.

5. The above will suffice for a sketch of the independent lohar's work as carried on all over the province. We now come to examine in more detail the work of the smith receiving wages in a factory or shop. To do so it will be most convenient to deal separately with the various branches of industry, showing where each one especially flourishes.

Iron safes, steel trunks, etc.

6. Perhaps the most widely produced articles of iron or steel are boxes of all kinds: they are manufactured in almost every city of any size in the Punjab, but those made in and around Gujranwala are the most worthy of notice.

In Gujranwala itself there are some 26 shops where iron safes, chests, almirahs, etc., are manufactured. They are sold at prices ranging from Rs. 6 to Rs. 16 and vary in size, sometimes weighing as much as 10 maunds. The iron of the best safes is usually about half an inch thick, roughly finished off inside, but generally decorated on the outside with gorgeous patterns. The safes themselves are quite plain inside except that occasionally they contain a cleverly concealed false bottom. No machinery is employed in the manufacture of these safes and naturally the work is of a somewhat crude and unpolished nature. They are, however, very widely used, and exported in large numbers to most parts of India. It is unfortunately impossible to obtain any even approximate figures to show the average outturn and export annually, but the trade appears to be in a fairly flourishing condition.

Besides the Gujranwala safes, those made in Jagadhri in the Ambala District are well worthy of mention. They are of much the same type, but slightly more elaborate. They stand about 3 feet high and have doors ornamented with brass handles, and false panels of figured brass. Inside they have several compartments one within the other, so that it is necessary to open four or five before reaching the last one. The methods used to make the safes secure vary considerably, but the fastenings and locks employed are generally most complicated and elaborate, and all sorts of artifices are resorted to. The safes are strongly made and show considerable ingenuity on the part of their manufacturers, but they have no finish about them, and frequently the various component parts do not exactly fit into each other. Considering, however, that these, like the Gujranwala safes, are made of ordinary sheet iron, and that the work is all done by hand, they are quite creditable productions.

Steel trunks and despatch boxes are made at Amritsar, Lahore, Delhi, Sialkote and Multan. Those of the last two cities are quite the best. The material is always foreign, and is imported. In Multan the most famous shop is that of Allibhoy Vallijee and Sons, whose despatch boxes are well-known all over India. The boxes are made out of tinned steel, and both machinery and hand labour are employed. The number of factories in Sialkote engaged in making steel trunks and despatch boxes has largely increased within the last few years, and there are now 14. The wages of the men employed vary from Rs. 5 to Rs. 15 a month, and the profits are believed to be about 25 per cent. The average annual export of these boxes from Sialkote is said to be 13,000, but there is no means of verifying these figures.

Iron Locks.

7. From trunks and safes one turns naturally to locks, which are largely manufactured in Jullundur, Ludhiana, Delhi, Sialkote and Gujrat. Of these Jullundur probably produces the largest number. There are some 200 workshops there, where locks are made, the number of workmen employed being about 300.

The locks are of two patterns, the screw pattern and the lever pattern. The screw pattern is the true native lock and is familiar to most dwellers in India. The lock is cylindrical and the key is fitted into the end furthest away from the loose end of the hasp. To open or lock one must unscrew or screw up the key.

As it usually requires five or six turns to open or close the lock, the process is somewhat tedious. The locks are strong and solidly made, but the workmanship is very rough. They vary in size from about 1½ inches to 3½ inches and the price is from one to eight annas.

The other pattern is the lever which is a rough imitation of the ordinary English lock. These locks are not so well made as the screw pattern and their cost is about double: hence their popularity is not very great.

The town of Rupar in the Ambala district has a great reputation for lock-making, but very few locks are made there now as a very large proportion of the inhabitants have died of plague, and there are said to be only two *lohars* left who understand the art of lock-making.

There is nothing remarkable or especially worthy of mention about the ordinary locks, but the lock makers of Rupar and the neighbourhood frequently like to show their skill and ingenuity in manufacturing puzzle locks of all kinds. At a recent exhibition there was a lock shown which was made by a *lohar* in Marauli village. It could only be opened after careful manipulation and was so constructed that, if any one who did not know the secret tried to open it, he released a handcuff which fastened on to his hand. This however is quite beyond the ordinary artisan's powers, and the usual lock, which is made of very highly polished iron is quite simple and is opened by two turns of the key.

Cutlery.

8. The manufacture of articles of cutlery flourishes chiefly in the Gujranwala and Sialkote districts and in Bhera in the Shahpur district. The articles however produced at this latter place deserve attention more because of their artistic setting, than from any utilitarian value, and will be discussed under the head of artistic manufactures. Nizamabad has the greatest reputation of the towns in the Gujranwala district, and a large assortment of knives, scissors, razors, etc., are manufactured there, though the outturn is not so great as one would suppose from the reputation of the place. The knives turned out are of all kinds, from the ordinary one-bladed penknife with a wooden handle, to the "multum in parvo" monstrosity familiar to all travellers who find themselves at Wazirabad and other stations in that neighbourhood.

On the whole, the articles are a fair imitation of those of English make though much more brittle and less durable, and the blades are not so well-tempered or polished. Unfortunately the manufacturers seem to prefer to show their skill and ingenuity in making enormous knives with a quantity of unnecessary blades and accessories rather than restrict themselves to a less elaborate article, and turn it out with more finish and durability. The trade however is flourishing, there being a considerable demand for the cutlery. The expenses of working are small and the profits realized amount to about Rs. 16 a month on an average. There is a considerable export trade, especially in the knives, which find their way all over Hindustan.

Besides the ordinary articles of cutlery, swords are also made at Nizamabad, generally out of "*ispat*" steel. These are, however, more widely manufactured in the Sialkote district, where there are 57 shops engaged in making swords and lance points. The profits in this branch of the trade amount to about 25 per cent.

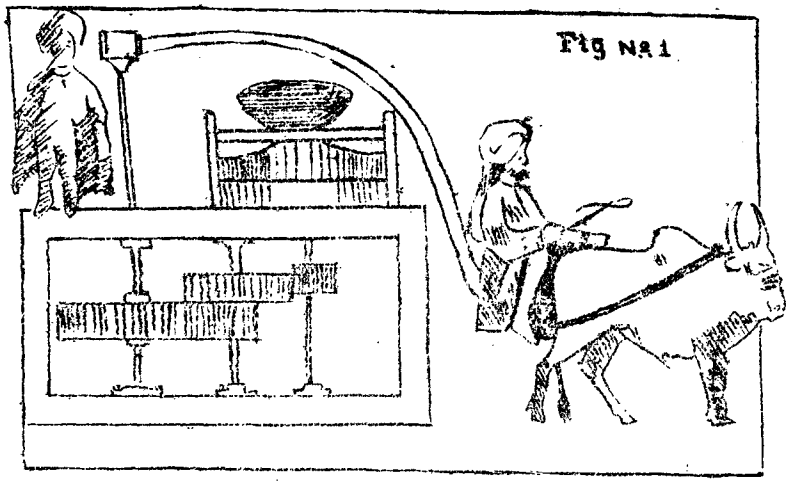
Cutlery of all kinds is also manufactured in Sialkote, the surgical and veterinary instruments turned out being of a very superior quality. The raw material is imported and obtained from Bombay, Calcutta or Karachi. The articles to be made are prepared in the ordinary way by heating and hammering, and when the right shape is obtained they are hardened by being placed when red hot in cold water with oil on the surface, or else in pure oil. The finishing processes of grinding, glazing, and polishing are carried out by means of wheels: first on a stone wheel, then on a wooden wheel faced with emery, and finally on wooden wheels faced with leather. This process is confined to the more delicate forms of cutlery; the common cheap articles are very roughly filed and ground and are often not polished at all.

The iron cutlery found in several places, but especially in Jullundur, deserves mention. Razors, scissors and knives can be bought for about 2 annas each. Naturally the workmanship is only rough, but the iron takes a very fair edge when sharpened, and the razors and scissors fully supply the needs of the village barber and tailor.

One cannot leave this branch of the industry without noticing the work of the bands of wandering lohars who are found in the Punjab. These men seem to come mostly from Bikanir: and their great speciality is the manufacture of talwars and axes, which are generally very deadly and strongly made.

Sugarcane presses, etc.

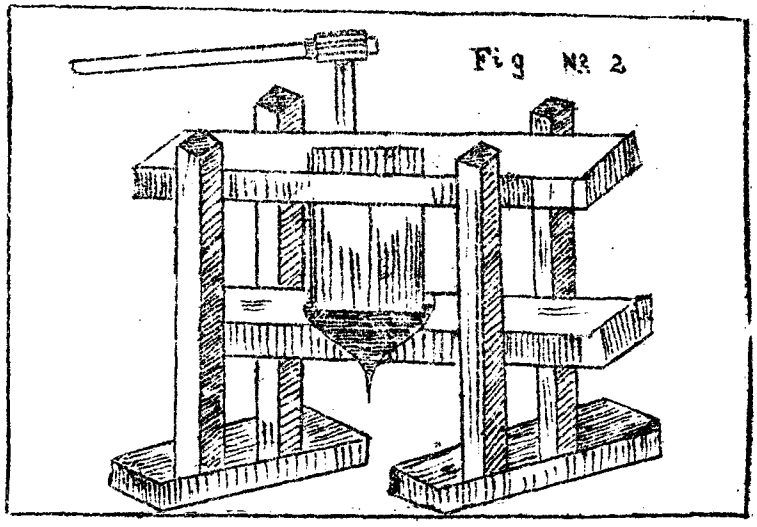
9. The town of Batala in Gurdaspur District is famous for the manufacture of sugarcane presses, flour mills, lathes, and various other articles of a like useful nature. There are six factories there, all concerned in the same kind of work, and the principal articles manufactured are as follows:—



(1) Flour mills or kharás.

These are very simply constructed mills largely used in most districts in the Punjab. They are worked easily by a single bullock.

The most important parts of the machine such as the wheels and brackets are made of cast iron, the nuts and bolts being usually of steel. The machine weighs about 7 maunds and sells for about Rs. 6 a maund.



(2) Sugarcane presses (belná kamád).

The sugarcane presses are also made mostly of cast iron, the rollers and wheels being of that metal, whilst the minor parts are steel.

The average price of a press is from Rs. 21 to Rs. 26.

(3) Lathes.

These are rarely made owing to the cost of production and the slight demand. The machines weigh from 20 to 30 maunds, and their price ranges from Rs. 300 to Rs. 700. They are distinctly well made and not very inferior to those of European manufacture.

These are the most important manufactures of the town, but various other smaller machines and a large assortment of miscellaneous articles such as pumps, seats, railings, bolts, screws, wheels, and the like are also manufactured. Most of the work is in cast iron procured from Lahore and Karachi for a price varying from Rs. 2 to Rs. 4 a maund. The process of moulding is as follows. The moulds are first prepared in wood, and then shaped out in the ground. The iron is melted in a furnace capable of holding 26 maunds, and when melted

passes into an iron bucket through a tube: it is then poured into the moulds in the ground. After being cooled the articles are finished off entirely by hand.

There are employed permanently in each factory three mistries and ten labourers—the former obtaining from Rs. 20 to Rs. 25 a month, and the latter about Rs. 10. The manufacturers do not willingly divulge their profits, but they are supposed to amount to about one anna in the rupee, which is probably approximately correct. The trade in this town is flourishing, the mills and presses being exported to most parts of the Punjab and United Provinces.

Artistic.

10. We turn now to the more interesting side of iron and steel work—the artistic—more interesting because, whereas the utilitarian work is not much better than a poor imitation of the western manufactures, the artistic is purely oriental and owes nothing to Europe. Unfortunately this branch of the trade covers a very small field. In fact art in iron and steel work is scarcely to be found in the Punjab, except in the "Koft" or damascene work of Kotli Loharan in the Sialkote district, and of Gujrat. This consists of the inlaying of gold and silver wire on steel or iron. For a general description of the work I think I cannot do better than quote Mr. Percy Brown, Principal of the Mayo School of Art, on the subject.

"The art is a very ancient one, but the name was invented by the crusaders who brought wonderful specimens of it with them from Damascus. It is interesting to note that no damascening is done in that city at the present time, the art having been extinguished when Damascus was conquered by Timur in 1401. This monarch conveyed many of the best specimens of the metal worker's art into Persia, and there is little doubt that during his victorious entry into India this art was introduced. Sialkote in the Punjab was probably the first place in which damascening was practised, and although it is carried on very successfully in various other places such as Jeypore, Datia in Central India, Serohi, Jodhpur and Alwar, it is believed that the art of these localities originally came from the Punjab.

"The damascening of India is of various qualities according to the different methods employed. The most valuable and truest form of the art is known as "Teh-nishan," from two Persian words which signify a plait or fold, and a mark or scar, thus indicating the origin of the art as far as India is concerned, as well as the mode of practising it. In this the pattern is first deeply engraved in the steel, and gold or silver wire hammered into the grooves. The surface is then filed, polished and 'blued.' When both gold and silver wires are used the combination is called 'Ganga-Jamni,' to signify the confluence of the two great rivers of Northern India.

"Another and cheaper form of this craft is to 'cross-hatch' the surface of the metal all over, so that it has a rough texture like a fine file. The pattern is lightly incised on this with a sharp steel style and then the finest of gold wire is pressed on to the lines with an agate burnisher. The article is next polished and "blued," and if carefully executed can easily be mistaken by the uninitiated for the better class of work. Most of the modern work is done in this way. There are several variations of this method, in some of which gold leaf is applied as well as the wire to the roughened surface, giving the appearance of greater richness and a more lavish use of the precious metal".

At the present time there is little or no damascening at Gujrat, but there is one factory at Sialkote with six workmen engaged in koftgari. The art probably originated in the ornamentation of arms, swords, daggers, etc., and appears to have been practised extensively up to the end of the Sikh rule. After that period, when owing to the Disarmament Act there was little or no demand for swords and the like, the workmen had to look for other articles on which to show their skill. The result now is that they have been compelled to copy various small articles of European origin. The work has suffered accordingly, and instead of using the old method of incised and deeply laid damascene the artists are content to simply scratch the pattern on the steel and iron, and hammer in a very fine gold wire pressing it down with an agate point.

This is the cheaper method referred to by Mr. Brown and it is unfortunately the one which is almost universally practised now-a-days. If the metal articles on which "koft" is now worked were of any real practical value, there would be some chance of the art regaining its former prominence. As it is, were it not for the tourist and the curio collector it would in all probability cease to exist. The work requires time, skill and patience and the profits are not large, hence the skilled workmen prefer to take employment in large factories and workshops, finding that they can thereby obtain a greater reward for their labours.

I now give a more detailed description of the process of manufacture, showing the names of the different implements. The iron or steel ground on which the wire is to be inlaid is smoothed with a file (*rawati*), and then polished with a pumice stone (*khingra*). The pattern is then incised with a steel pen, after which the article is heated in a clear fire for a few minutes and blued. The gold wire to be inlaid is also heated and softened. The wire is then placed into the lines with an iron pencil (*pathrani*), it is then hammered and rubbed with an agate point (*mohari*). If it is necessary to cut the wire at all scissors (*kath*) are used, but in the modern work generally short lengths of wire are employed.

11. We turn now from this branch of the work to the artistic cutlery of Bhera in the Shahpur district. Strictly speaking this should not be considered under the head of artistic iron and steel work, for the art is not so much in the metal as in the stone handles and ornamentations of the articles manufactured. But the metal and stone-work are so essentially connected that they cannot well be considered apart. Bhera was once famous for the manufacture of arms and weapons of all kinds, and as at Sialkote the trade flourished till the Disarmament Act when the demand ceased. The industry, however, still continues, but its sphere is much contracted, only knives, scissors, razors and the like being made; but as we have pointed out above, the metal-work is, as a rule, merely a peg on which to hang the ornamental stone-work. The craftsmen are "lohárs" calling themselves "Awáns" by caste. They live together in one *mohalla* of the city and are all interrelated If their claim to be "Awans" is true, they probably came from the Salt Range on the northern side of the Jhelum, but as to this they have no traditions. In fact, the origin of these people and of their industry is lost in obscurity.

bics The process of manufacture of the cutlery is very simple: the furnace used is of clay generally about one and a half feet high, and one foot broad at the base. It has an opening at the top for a chimney, and another at the bottom for the bellows; the fuel used is charcoal. The raw material is old iron, which is heated in the furnace and then beaten out into the required shape on an anvil, after which it is cooled in water with an eighth part of oil on the surface. The article is then roughly polished by means of the "san" and "matsan." The "san" is formed by a mixture of fine sand and lac. The "san" is first heated, then, the lac being mixed with it, the whole is put into a mould which turns it out in a round shape like a thin grinding stone.

The "matsan" is made the same way, pounded stone called "kurand" taking the place of the sand. The article is first rubbed on the "san" and then on the "matsan" to which generally a little oil is applied. This does not produce a very hard metal, and the knives very soon wear out. It would seem likely that at the time when swords and daggers were made some better hardening and tempering process was in use, but the present workers know of none.

The ornamentation is in the handles of the articles, which are constructed of a kind of jade (plasma) or a mosaic of jade with a black stone called "moosa" and a white stone known as "suleimani": the interstices are filled with paste There is little or no originality shown by the craftsmen, there being practically only one pattern.

There is a very fair demand for the articles, the scissors and razors being largely used by the tailors and barbers of the district, whilst there is a considerable export trade in the ornamented articles, which are sent to various cities in India to be sold as curios. There is no regular system of export, but travelling merchants frequently visit the town, and are said to take the goods with them even as far as Hyderabad and Kabul. Exhibits of the art have also been sent to

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Europe to the Glasgow Exhibition of 1887 and the Indian Exhibition of London 1885. of

There is no means of ascertaining the average output per annum, but it amounts probably to about 25 maunds, of which about two-thirds are made up of purely utilitarian articles. There are eighteen families consisting of 45 workmen engaged in the industry. Many of the craftsmen, however, have given up their old family industry owing to the inconsiderable demand. No worker admits a greater profit than Rs. 10 a month and this is probably about the limit for those engaged purely in metal-work, but the artistic craftsmen are in considerably better circumstances. Hunting knives with stone handles average from Rs. 2 to Rs. 4 in price, and a knife and fork similarly ornamented cost about Rs. 4, whereas the scissors are 3 or 4 annas a pair only.

The industry cannot be said to be in a satisfactory state. It suffers in the same way as the *koftgari* of Sialkote: the metal manufactures cannot compete with similar articles made by European processes, and the artistic-work suffers from want of some ground-work of real practical value on which to be exhibited.

12. There is no other iron or steel work in the Punjab worthy of consideration and it remains only to look briefly at the general state of the trade. Speaking generally, there is no doubt that articles manufactured on European lines are stronger, more durable and better in every way than those made by native methods. The latter are certainly cheaper to buy, but are of little real value to the man requiring a good strong article for practical use. They do of course suffice for the needs of a poor villager at present, but as the standard of living rises, the quality of native manufactures will not rise in proportion, simply because the processes employed are not of such a kind that they can ever supply articles suited to a high standard of living.

As regards articles of purely utilitarian nature there is no doubt whatever that the demand for European manufactures is steadily increasing: it is not of course very obvious in the villages, but in the towns and cities the Sheffield manufacturer is certainly ousting the native "lohar". There can, I think, be only one conclusion, that the latter, in order to compete with the former, will in time be compelled to resort to European processes.

This of course is not the case with articles of artistic value. But as we have pointed out above this class of work is only of value to the curio collector and the artist, and the demand in consequence is small, hence the workers naturally prefer to obtain employment in large workshops and factories where they can receive a higher and steadier rate of pay.

The outlook for the purely indigenous iron and steel industry is not promising but the trade as a whole has, I think, a bright future before it. There is an ample demand for all kinds of iron and steel goods, which are strong and well-manufactured, and all that is required for the production of such articles is greater knowledge on the part of the workmen. This they are no doubt gradually acquiring, mainly through employment in Railway and Canal workshops, and there is every prospect that in time a native artisan will be as familiar with intricate European processes, as they are with their own crude methods at the present day. There is no reason why they should not turn out as good work as European craftsmen, for they by no means lack skill they only require teaching and development.